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Deniz Gevrek
Z. Eylem Gevrek
Cahit Guven

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Deniz Gevrek
Texas A&M University, Corpus Christi and IZA

Z. Eylem Gevrek
University of Konstanz

Cahit Guven
Deakin University

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

Benefits of Education at the Intensive Margin: Childhood Academic Performance and Adult Outcomes among American Immigrants*

Using the Children of the Immigrants Longitudinal Study (CILS), we examine the association between education at the intensive margin and twenty pecuniary and non-pecuniary adult outcomes among first- and second-generation American immigrant youth. Education at the intensive margin is measured by two widely used standardized math and reading test scores, national percentile rankings on these tests and cumulative grade point average (GPA) in both middle and high school. Our findings provide evidence that the academic achievement of immigrant children in early adolescence is an accurate predictor of later life outcomes. We also examine a novel hypothesis that relative academic performance of immigrant children in high school compared to middle school, which could be an indicator of change in adolescent aspirations and motivation as well as the degree of adaptation and assimilation to the host country, has an effect on their adult outcomes even after controlling for the levels of academic performance in middle and high school. The results suggest that an improvement in GPA from middle school to high school is associated with favorable adult outcomes. Several sensitivity tests confirm the robustness of main findings.

JEL Classification: I2, J15, J24

Keywords: economics of education, human capital, immigrant well-being, immigrant academic performance, immigrant assimilation

Corresponding author:

Deniz Gevrek
Texas A&M University, Corpus Christi
6300 Ocean Drive
Corpus Christi, TX 78412
USA
E-mail: deniz.gevrek@tamucc.edu

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1 Introduction

An extensive theoretical and empirical literature substantiates pecuniary and nonpecuniary benefits of education.[1] In their comprehensive study, Oreopolous and Salvanes (2011) provide evidence that more schooling is associated with favorable outcomes not only in the labor market (e.g. higher levels of labor force participation, job satisfaction, occupational prestige, lower unemployment probability, shorter unemployment spells, lower likelihood of being on welfare) but also outside the labor market (e.g. better individual health, life satisfaction and happiness, more stable and happier marriages, better parents, more successful children, reduced myopia, reduced criminal and risky behavior such as teen fertility, lower likelihood of having been incarcerated and lower likelihood of smoking).

Most of the studies in the literature explore the impact of education at the extensive margin measured by completed years of schooling. There are a relatively small number of studies that investigate the impact of education at the intensive margin measured by standardized achievement tests, high school and college GPA and class rank on adult outcomes (Weisbrod & Karpoff, 1968; Wise, 1975; James et al., 1989; Grogger & Eide, 1995; Crawford et al., 1997; Le & Miller, 2004; Heckman et al., 2006; Spinks et al., 2007; Hamermesh & Donald, 2008; Lleras, 2008; Segal, 2013; French et al., 2014).

Using data from the Children of the Immigrants Longitudinal Study (CILS), this study examines the relationships between academic performance measured in middle and high school and twenty pecuniary and non-pecuniary adult well-being outcomes among first- and second-generation American immigrant youth.

[1] See e.g., Angrist & Krueger, 1991; Kane & Rouse, 1995; Card, 1995; 2001; Acemoglu & Angrist, 2001; Meghir & Palme, 2005; Oreopoulos, 2006; Aakvik, Salvanes & Vaage, 2010; Oreopoulos & Salvanes, 2011; Riddell & Song, 2011.

Immigrant children make up nearly 25 percent of school children in the US. (Haskins & Tienda, 2011). The number of immigrant children increased by 66 percent between 1995 and 2012 (Child Trends, 2013). Given the size and unprecedented growth of the immigrant children population, it is of great importance to explore these relationships in the context of American immigrants.[2]

In this study we also examine a novel hypothesis that the gap in academic performance between middle and high school could be related to adult well-being outcomes even after controlling for the levels of academic performance in middle and high school. Adult well-being depends on several decisions made relatively early in youth such as exerting high effort in classes, allocating sufficient time for homework and schoolwork, receiving a high school diploma, pursuing a college degree, and choosing a major. Although various factors affect these decisions, an individual's motivation and expectations are among the most important factors. We believe that an improvement or a decline in GPA from middle to high school could be associated with better or worse outcomes later in life, which might be reflected in expectations, motivation and competitiveness at younger ages.[3] Moreover, changes in educational performance during the critical years of adolescence could be an indicator of the degree of adaptation and assimilation of immigrant youth.[4] To our best knowledge this is the first study that investigates whether academic performance in high

[2]There are several studies that use the CILS data to explore the relationship between academic performance in childhood and adult well-being outcomes (Portes at al., 2005; Rumbaut, 2005; Haller et al., 2011; Portes & Rivas, 2011). However, these studies either focus on a limited number of adult outcomes, certain geographical areas and ethnicities or consider one or two measures of academic achievement. Using several measures of academic achievement in middle and high school, our study provides a comprehensive examination of indicators reflecting various aspects of adult well-being.

[3]Delaney et al. (2011) find a strong positive relationship between student expectations during college and adult socioeconomic status, which persists even after controlling for a rich set of covariates including previous academic performance. Feliciano and Rumbaut (2005) conclude that early educational expectations and aspirations are important predictors of completed schooling and occupational choices for American immigrant youth.

[4]Previous literature considers academic performance as an indicator of assimilation and adaptation of immigrant children into the host country (Zhou, 1997).

school relative to middle school is important in explaining adult outcomes of immigrant children.[5]

The CILS consists of three rounds of interviews that were conducted in two of the most preferred immigrant destination states in the US, namely California and Florida. The first round was conducted when immigrant children were in eighth or ninth grade. The second round was conducted three years later during grades 11 or 12 and the last round was conducted approximately 10 years after the first round to measure adult well-being outcomes of those immigrant children. This unusually rich data set contains information on academic performance, demographic characteristics, detailed school information, parental socioeconomic and demographic characteristics, language use, employment and job status, and incarceration history, among other important characteristics.

To measure education at the intensive margin, we use middle school (round 1) and high school (round 2) cumulative grade point averages (GPAs) and two widely used standardized math and reading test scores (ASAT) and national percentile rankings on these tests measured during middle school (round 1). Twenty pecuniary and nonpecuniary adult outcomes (measured in round 3) used in this study reflect different aspects of adult well-being and can be grouped into the following three categories: labor market outcomes (personal earnings, job prestige score, labor force participation, unemployment, self-employment, income satisfaction, job satisfaction, first job prestige score, and expected job prestige score at the age of 30); educational outcomes (completed schooling; currently in school; expected schooling at the age of 30; and subjective English reading, understanding, writing and speaking abilities); and health and social outcomes (health insurance status, subjective health status, sickness status, and arrest or incarceration history).

[5]We did not find any studies that investigate this hypothesis in the context of natives either.

We do not have exogenous shifters; therefore, terms like "matter" should not be understood in a strong causal sense. However, our results could be interpreted as an effect that is stronger than a simple correlation for the following reasons: We account for a wide range of control variables in our econometric model to alleviate the problem of omitted variables bias. In addition, there is a clear time order among variables because of the longitudinal character of the CILS data. Control variables were not measured at the same time as outcome variables but with a lag of several years.

Our findings regarding educational outcomes indicate that all the academic achievement measures are positively associated with educational attainment. However, only ASAT reading achievement test performance can predict immigrants' English language skills in adulthood. ASAT math national percentile ranking is positively related to the likelihood of attending school at average age 24, pointing out the importance of math achievement on higher education enrollment. In terms of labor market outcomes, we find that academic achievement in middle school has a positive impact on occupational achievement later in life as measured by job prestige scores. Performance on both the ASAT reading and math achievement tests is negatively correlated with the probability of being self-employed. The results also provide evidence that higher academic achievement is associated with lower likelihood of being in the labor force. But, conditional on being in the labor force, immigrants with higher academic achievement are less likely to be unemployed. With respect to health outcomes, we find that higher academic achievement predicts lower probability of being seriously sick or disabled and higher probability of having health insurance.

Academic performance in high school relative to middle school matters for future well-being even after accounting for absolute performances. The results suggest that

immigrants with higher GPAs in high school compared to middle school complete more schooling, report better health and are more likely to have health insurance. We also find that an increase in GPAs from middle to high school is negatively associated with the probability of being in the labor force at average age 24 and predict higher job prestige scores. Using a two-stage correction procedure proposed by Heckman (1976), we show that the core findings are not driven by possible sample attrition bias. Moreover, we study female and male and first- and second-generation immigrants separately to explore the potential heterogeneity across these subsamples.

The remainder of the paper is organized as follows: Section 2 describes the data and variables used in the empirical analysis. Section 3 introduces our econometric framework, presents results and robustness tests, while Section 4 concludes.

2 Data

The data used in the empirical analysis come from the three rounds of the Children of the Immigrants Longitudinal Study (CILS) conducted in the 1992-2003 period (Portes and Rumbaut, 2005, 2008). The CILS data provide unusually detailed information on immigrant children's demographic characteristics, academic performance, school properties, language use, subjective measures of well-being, parental socioeconomic and demographic characteristics.[6] The sample consists of second-generation immigrant children who were born in the US with at least one immigrant parent and first-generation immigrant children who were born abroad and brought to the US before they were ten years of age. The CILS is the largest study that follows teenage immigrants from various nationalities in

[6]Definitions of all variables used in the current analysis are provided in Table A.1 of the Appendix.

two of the most preferred immigrant destination states in the US, California and Florida.[7] The interviews were carried out in three cities: San Diego, Miami and Ft. Lauderdale. The immigrant children in the CILS data are representative of the current immigrant population in the US.

Table 1 provides a breakdown of the CILS sample by national origin and immigrant generation. Table 1 shows that the sample is evenly divided between first- and second-generation immigrants. Children of immigrants coming from four countries (Mexico, the Philippines, Cuba, and Vietnam) constitute 60 percent of the sample. Rumbaut (2005) points out that although recent immigrant flows to the US originate from 150 different countries, about 40 percent of immigrants come from those same four countries. It is also worth noting that Nicaraguans and Laotians are among the principal nationalities represented in the first-generation immigrants sample while they make up only 1.7 percent of the second-generation immigrants sample.

The first interview was conducted with immigrant children who were attending eighth or ninth grades in 1992. Since younger children have relatively lower dropout rates, the survey was restricted to eighth and ninth graders to avoid sample selection bias that would arise from immigrant children dropping out of school. The first round of the CILS has detailed information on 5262 immigrant children of 77 nationalities that reflect the immigrant population in those localities.[8] The second round of the survey was conducted three years later in 1995 when the respondents were about to graduate from high school. The survey response rate was 81.5 percent with 4288 of the originally surveyed respondents. A decade after the first round, the third round of the survey was conducted and

[7]The Congressional Budget Office calculates that California has the largest share of the immigrant population in the US with 26.2 percent and Florida ranks fifth with 16.7 percent in 2000. Source: http://www.cbo.gov/ftpdocs/60xx/doc6019/11-23-Immigrant.pdf.

[8]See Portes and Rumbaut (2001) for detailed discussion on the data set.

achieved a 63.5 percent response rate with 3344 of the original respondents answering questions about educational attainment, employment and job status, family characteristics, and incarceration history among other important demographic and socioeconomic characteristics. In the next section we provide some descriptive statistics that shed light on sample attrition.

2.1 Summary statistics.

Table 2 presents the summary statistics for the variables which are grouped by three rounds of the CILS interviews. Definitions of all variables presented in Table 2 are provided in Table A.1 of the Appendix. We use ASAT math and reading scores, national percentile rankings on ASAT math and reading tests, middle school GPA, which is measured in round 1, and high school GPA, which is measured in round 2 as proxies for academic performance during childhood. The first panel of Table 2 shows that immigrant children have an average GPA of 2.52 out of 5 in round 1. Average ASAT math and reading scores of immigrant children are 694 and 664 respectively. A similar pattern arises in terms of the relative national percentile rankings on standardized math and reading tests. Immigrant children achieve, on average, a higher national percentile ranking on the ASAT math exam (53.2 percentile) than on the ASAT reading exam (41.6 percentile).

The average age of the students is 14.23 years. The sample is about evenly balanced between males and females. The eighth graders make up 46 percent of the sample. Half of the children were born overseas (first-generation immigrants) and over 90 percent of the children speak a language other than English at home, suggesting that most of the immigrant children retain their parents' language.

The descriptive statistics on family background variables show that the average number of older siblings is 1.69. Sixty-four percent of the children live with both biological parents. The educational attainment of fathers is higher than that of mothers. For example, fathers with tertiary education constitute 47 percent of the sample, whereas this rate is 43 percent for mothers. However, the average job prestige score does not vary significantly between fathers and mothers. Fifty-five percent of the sample lives in families who own their homes.

Fifty-five percent of the children felt discriminated against. The depression and self-esteem indices capture the two key cognitive dimensions of psychological well-being of immigrant children. The depression index (self-esteem index) ranges between 1 to 4, with smaller (larger) values reflecting better psychological well-being. The mean value of the self-esteem and depression indices are 3.30 and 1.65 respectively. Immigrant students spend 2.48 hours, on average, studying or doing homework per day and 66 percent of them aspire to earn advanced degrees.

School level characteristics indicate that the student ethnic composition in the schools is predominantly Hispanic. Forty-two percent of the students attend schools where Blacks and Hispanics constitute at least 60 percent of the school population. Students attending private schools make up only four percent of the sample. The proportion of students eligible for the federally subsidized lunch program at a school, which is an indicator of the socioeconomic composition of a school, ranges between 0 to 92.2 percent with a mean value of 45 percent.

In the first round, immigrant students were also asked to evaluate their ability to speak, understand, read, and write in English. The mean values of self-reported English proficiency variables show that most students reported having a high level of proficiency

in English.

The second panel of Table 2 shows that the average high school GPA is slightly lower than the average middle school GPA. The students, on average, dedicated more hours to school work in high school than in middle school. The average annual drop-out rate in high schools attended by the youths in the CILS sample is 5.5 percent while the proportion of the daily attendance at those schools ranges between 88 percent and 96 percent. The average of the subjective measure of high school quality index is 2.93 out of 4 points, suggesting that students, on average, rank their schools somewhat favorably.

The third panel of Table 2 presents descriptive statistics from the third round of the CILS survey when respondents reached an average age of 24. In the third round, the average completed schooling is 14.3 years. Fifty-one percent of the respondents are still in school. Therefore, they expect to complete an average of 16.75 years of education by the age of 30. On average, self-reported English proficiency improves from round 1 to round 3. Ninety percent of the immigrants are in the labor force while nine percent are unemployed. Self-employed immigrants make up five percent of the sample.

The average of expected job prestige score by age 30 is higher than that of current job prestige score and first job prestige score, suggesting that the mean job prestige score increases over time. Immigrants, on average, exhibit higher levels of job satisfaction than income satisfaction. Immigrants with health insurance constitute 74 percent of the sample. Six percent of the immigrants report that they became seriously ill or disabled during the last five years while seven percent of them report having been arrested or incarcerated between the ages of 18 and 24.

Table A.2 of the Appendix presents correlations between the six measures of academic achievement. Table A.2 indicates that GPAs correlate positively with other indicators

of academic achievement. However, the correlations, which range from 0.29 to 0.55, are of moderate size, pointing to the importance of using math and reading standardized test scores as alternative indicators of academic achievement. Although GPA possesses certain characteristics that make it a useful measure of academic achievement, it has important limitations. For example, grading scales may not be uniform in different types of schools, leading to a high variation in GPAs across school systems. Moreover, Table A.2 shows that the correlations between math scores and GPAs are higher than those between reading scores and GPAs.

CILS interviewed immigrant children three times from early adolescence at average age 14 to early adulthood at average age of 24. The second round retrieved 81.5 percent of the original sample while the third round produced data on 63.5 percent of the original sample. Sample attrition may be an issue unless it was random. Portes and Rumbaut (2001) provide evidence that the second round sample is representative of the original sample in almost every respect. They indicate that children from intact families (i.e. both biological parents present) are slightly overrepresented in the second round, and all other differences are not statistically significant.

Table 3 allows us to compare the final sample to the original sample on its characteristics measured in the first round. Several points are worth highlighting from the descriptive statistics presented in Table 3. First, the mean values of all the academic achievement measures in the third round are slightly lower than those in the first round, implying that children with lower academic achievement are more likely to drop out of the sample in the final round. Second, females, second-generation immigrants, those from well-off and two-parent families are more likely to be included in the final sample. Third, the final survey also retrieved respondents with higher educational aspirations and

slightly better psychological well-being.

Using data from the CILS South Florida sample, Portes et al. (2005) examine the determinants of the following key outcomes in early adulthood: educational attainment, occupational status, family income, the probability of having children, and the probability of having been incarcerated. The authors account for the possible sample selection bias using a two-stage correction procedure proposed by Heckman (1976). First, they estimate the probability of being interviewed in the third round as a function of age, family composition and early academic performance with a probit model and obtain the inverse Mills ratio. Second, they include the inverse Mills ratio as an additional explanatory variable in the estimation of adult outcomes.

Their results show that the coefficient of the inverse Mills ratio is statistically insignificant for all outcomes except for educational attainment, providing evidence that sample attrition does not bias results. The coefficient of the inverse Mills ratio is negative and statistically significant in the educational attainment equation, indicating that respondents who left the sample in the third round would have had lower education than those actually interviewed. This finding is consistent with descriptive statistics presented in Table 3 and the first stage estimation results of Portes et. al. (2005) indicating that intact families, higher family SES, and higher grades in middle school are all positively related to participation in the third round.

We also use Heckman's (1979) two-stage estimation method to correct for possible sample selection bias arising from the fact that the final CILS survey retrieved 63.5 percent of the original sample. The results based on the correction procedure, which are summarized in the robustness checks section, provide evidence that sample attrition is unlikely to lead to significant bias.

3 Empirical Methodology and Results

3.1 Academic performance during childhood and adult outcomes.

To examine the importance of academic achievement in middle and high school in predicting pecuniary and nonpecuniary adult outcomes, we run a series of regressions of the following type:

$$Y_i = \beta_0 + \beta_1 A_i + X_i'\delta + \varepsilon_i \tag{1}$$

where Y_i represents the realization of a certain adult outcome for individual i measured in the third round when immigrant children were on average 24 years old. We calculate marginal effects using a Probit model for binary dependent variables and calculate coefficient estimates using OLS otherwise. The main variable of interest, A_i, is one of the five academic performance measures for individual i measured in the first round of the survey. In our analysis we use GPA and standardized math and reading test scores (ASAT) and national percentile rankings in these tests as proxies for academic performance. X_i is a vector of explanatory variables measured in round 1 and round 2. The estimations are carried out through two specifications. In the basic specification, X_i includes a male dummy, age, age-squared, number of older siblings, two indicator variables for Miami and Ft. Lauderdale, and dummies for 8^{th} grade, for US-born individuals, and for different countries-of-origin. All explanatory variables used in the basic specification are measured in round 1. The extended specification adds to the basic specification both round 1 variables (household size; dummies for presence of both biological parents, parental education, income levels, home ownership, speaking a language other

than English at home, and for being discriminated; parental occupational prestige; number of friends; aspiration to get a graduate degree; self-esteem and depressions indices; desired status and job prestige; hours studied; and school characteristics: dummies for minority and inner-city schools; white, black, hispanic and asian percentages in school; percent eligible for subsidized lunch at middle school; and school population) and round 2 variables (self-esteem and depressions indices, hours studied, and school characteristics: school population, private school dummy, school drop-out rate, percent of students who regularly attend school, and subjective school quality). Standard errors are clustered at the school level (school as of round 1).

The first nonpecuniary adult outcome we focus on is the completed years of schooling. We run five regressions, each of which includes one of the five measures of academic achievement as the main variable of interest. The results based on the basic and extended specifications are presented in Tables 4 and 5 respectively. Findings from Table 4 can be summarized in four main points. First, all the measures of academic achievement have the expected positive signs and are statistically significant at the one percent level. An increase in middle school GPA by one standard deviation is associated with an increase of 0.91 years of schooling while a one standard deviation increase in ASAT math (reading) score corresponds to an increase of 0.72 (0.65) years of schooling. The effect of ASAT math national percentile ranking is similar to that of ASAT reading national percentile ranking. A one standard deviation increase in ASAT math (reading) percentile ranking implies an increase of 0.65 (0.64) years of schooling. Second, females and those who were attending the 8^{th} grade in the first round of the survey have higher educational attainment.

Third, consistent with the argument that an increase in family size causes parents to

have less available time for each child, which may affect educational outcomes of children, we find that the number of older siblings has a negative impact on educational attainment. Fourth, when we use middle school GPA, ASAT math score, or ASAT math national percentile ranking as a measure of academic achievement, the coefficient of the US-born dummy is positive and statistically significant, implying that second-generation immigrants complete more schooling than first-generation immigrants. However, the coefficient turns out to be statistically insignificant in the last two specifications where the measures of academic performance are ASAT reading score and ASAT reading national percentile ranking, suggesting that there is a positive and statistically significant correlation between being a second-generation immigrant and ASAT reading achievement test performance.

Table 5 indicates that the inclusion of additional covariates causes the coefficients of the measures of academic performance to decrease by approximately 10 to 40 percent. However, they remain statistically significant at the one percent level. A one standard deviation increase in middle school GPA, ASAT math score, ASAT reading score, ASAT math national percentile ranking and ASAT reading national percentile ranking is associated with an increase of 0.68, 0.46, 0.42, 0.41 and 0.41 years of schooling, respectively. Table 5 provides evidence that parental socio-economic status plays an important role in explaining the educational attainment of immigrant children. For example, having belonged to families that own their homes is associated with higher educational attainment, and those whose mothers have tertiary education complete more schooling. Information on family economic status, which is categorized into low income, middle income and high income, was obtained indirectly from immigrant children. Unexpectedly, the coefficients of family economic status variables are statistically insignificant. This finding might be

due to measurement error in the self-reported family economic status variables. Moreover, living in an intact family in early adolescence affects subsequent educational attainment positively.

Table 5 shows that aspirations and psychological well-being also matter. Higher self-esteem and lower depression are associated with higher educational attainment. Immigrant children who aspire to earn advanced degrees do better in terms of educational attainment. The socioeconomic and ethnic composition of schools attended in early adolescence affect the educational attainment of immigrant children. For example, attending a minority school has a negative impact on subsequent educational attainment. The results also suggest that educational attainment is significantly influenced by the number of hours a day spent on studying and doing homework.

Next, we examine the relationship between academic achievement measured in early adolescence and 20 educational, labor market, health and social outcomes measured in early adulthood. Table 6 replicates the basic specification of Table 4 while Table 7 replicates the extended specification of Table 5 for each of the 20 adult outcomes. As the statistically significant coefficients are similar between the extended specification presented in Table 7 and the basic specification presented in Table 6, we focus on the results reported in Table 7. The top panel in Table 7 shows that all the academic achievement measures are positively related not only to educational attainment at average age 24, but also to expected educational attainment by age 30. ASAT math national percentile ranking measured in middle school is positively associated with the probability of being at school at the time the third round of CILS was conducted when respondents had reached early adulthood, underlining the importance of math achievement on higher education enrollment. A positive and statistically significant relationship is found between ASAT

reading achievement test performance and self-reported English reading, understanding, speaking, and writing abilities, suggesting that standardized tests measuring adolescent reading proficiency predict immigrants' English language skills in adulthood successfully.

The two middle panels of Table 7 show nine pecuniary and nonpecuniary labor market outcomes. All the measures of academic achievement in middle school except GPA have a positive impact on personal earnings. Very few studies examine whether secondary school performance, as measured by high school GPA affects future labor market outcomes. Crawford et al. (1997) find a positive effect of high school GPA on early labor market outcomes for those who started working right after high school graduation. A number of studies investigate the relationship between academic performance in college and labor market outcomes. However, only a small number of those studies control for pre-college academic achievement as measured by high school GPA and high school rank in their analysis. Wise (1975), Grogger and Eide (1995), Hamermesh and Donald (2008) provide evidence that high school GPA has a weak effect on labor market outcomes.

Table 7 also indicates that individuals with higher GPAs are less likely to be in the labor force at average age 24. However, conditional on being in the labor force, higher GPAs and national percentile rankings in ASAT reading test are associated with reduced likelihood of being unemployed. In line with Eren and Sula (2012) who examine the impact of adolescent cognitive ability, as measured by aptitude and knowledge tests, on self-employment in the US, our results indicate that higher math and reading test scores and national percentile rankings are associated with a lower probability of being self-employed.

We do not find very strong effects of academic achievement in middle school on job and income satisfaction in early adulthood. Higher ASAT math score percentile rankings

predict higher job satisfaction while higher ASAT reading scores predict lower income satisfaction. The estimated coefficients are statistically significant only at the ten percent level. All five measures of academic achievement have positive and statistically significant effects on all three job prestige scores (i.e. first job prestige score, current job prestige score, and expected job prestige score by age 30), suggesting that academic achievement in middle school is an important predictor of occupational achievement later in life. The bottom panel of Table 7 shows four health and social outcomes. We find that all the measures of academic achievement, except ASAT reading score, are positively associated with the probability of having health insurance. Individuals with higher GPAs, math scores and math percentile rankings are less likely to be seriously sick or disabled. The results suggest that higher GPAs predict a lower probability of committing crime in early adulthood.

The unreported statistically significant relationships between control variables used in the extended specification and the adult outcomes can be summarized as follow: First, the number of older siblings has a negative impact on English understanding ability, health status and probability of being seriously sick or disabled. Second, household size is negatively related to English writing and speaking abilities, job satisfaction and prestige scores, probability of being in school at an average age of twenty-four and probability of having health insurance. Third, living with both biological parents in early adolescence is linked to higher income satisfaction, higher first job prestige score, and higher expected educational attainment by age 30. Living in an intact family is also associated with a reduced likelihood of being involved in criminal activity. Fourth, parental characteristics play an important role in shaping adult outcomes. Moreover, our results point to the importance of aspirations and psychological well-being measures in explaining adult

outcomes. We find that higher aspiration during adolescence is associated with more favorable adult outcomes while lower self-esteem and higher depression are linked to less favorable adult outcomes.

In sum, the results presented in Table 7 provide evidence that the academic achievement of immigrant children in early adolescence is an accurate predictor of a wide range of outcomes in early adulthood.

3.1.1 Robustness checks

We perform several sensitivity tests to investigate the robustness of our main findings presented in Table 7. First, we utilize Heckman's (1979) two-stage correction procedure to provide evidence that our results are not driven by sample attrition bias. In the first stage, we estimate the probability of participating in the final CILS survey with a probit model by using change in living conditions as an exclusion restriction. In the second stage, the estimated probit parameters are used to calculate the inverse Mills ratio, which is included as an additional explanatory variable in the estimation of adult outcomes. The longitudinal character of the CILS data allows us to impose such an exclusion restriction. In the first and second rounds of the CILS, immigrant children were asked to report the status of their living conditions by choosing one of the following household guardianship categories: living with father and mother, living with father and step-mother or other female adult, living with mother and step-father or other male adult, living with father alone, living with mother alone, alternate living with father and mother, living with other adult guardian, and living with other. We construct a dummy variable that takes the value of one if children experienced a change in their living conditions between round 1

and round 2 and zero otherwise.[9] We conjecture that immigrant children who experienced such a change in their lives are more likely to move from their place of residence, causing a decrease in the probability of being interviewed in the final round of the CILS.

Findings from the Heckman correction procedure can be summarized in three main points. First, consistent with our conjecture, we find that the coefficient of the dummy variable for change in living conditions is negative and statistically significant in the first-stage regressions. Second, in most of the cases the coefficient of the inverse Mills ratio is not statistically significant, suggesting that sample attrition does not result in significant bias. Table 8 shows the following six cases where the coefficient of the inverse Mills ratio is statistically significant: completed schooling and personal earnings when ASAT math score is used as a measure of academic achievement, expected job prestige score when ASAT math score and national percentile ranking on the ASAT math test are used as measures of academic achievement, English writing ability when national percentile ranking on ASAT reading test is used as a measure of academic achievement, and probability of being arrested or incarcerated when GPA is used as a measure of academic achievement. Except in the latter two cases, the coefficient of the inverse Mills ratio has a negative sign, indicating that failure to correct for sample attrition bias would produce upwardly biased estimates. Third, Table 8 reveals that after using the Heckman correction procedure, the measures of academic achievement do not have a statistically significant impact on personal earnings. The favorable impact of GPA on the probability of being arrested or incarcerated turns out to be statistically insignificant.[10] Moreover, the impact of ASAT math achievement test performance on expected job prestige score

[9]The descriptive statistics indicate that 774 out of 4243 immigrant children interviewed in the first two rounds experienced a change in their living conditions between rounds 1 and 2.

[10]Portes at al. (2005), Rumbaut (2005), Heckman et al. (2006) also find that there is no statistically significant relationship between adolescent academic performance and adult criminal behavior.

becomes less pronounced.

Second, we examine the possibility of non-linear effects of measures of academic achievement on adult outcomes. We recode the measures of academic achievement into four quantiles and replicate the empirical analysis presented in Table 7. Our results suggest that in most of the cases there are no non-linear effects. Third, we estimate a school fixed effects model to investigate whether unobserved school characteristics affect our results. We find that replacing school characteristics with school fixed effects does not change the main results. Fourth, as seven out of twenty adult outcome variables are ordered in nature, we estimate the categorical measures of self-reported English proficiency (reading, understanding, speaking and writing), income satisfaction, job satisfaction and subjective health with ordered probit. There are two minor changes in the results. We find that not only ASAT reading test performance but also ASAT math test performance is positively associated with the probability of understanding and writing English very well. The negative impact of ASAT reading score on income satisfaction turns out to be statistically significant. We conclude that estimating the ordered probit model has little impact on the main findings. Results from nonlinear effects, school fixed effects and ordered probit models are not presented to conserve space but are available upon request from the authors.

Fifth, we study males and females separately. Most of the estimates for males presented in Table A.3 are similar to those for females presented in Table A.4. Differences can be summarized in four main points. First, the positive effect of ASAT math percentile ranking on the probability of attending school in early adulthood is statistically significant only for females while the negative effect of GPA on the probability of being in the labor force is statistically significant only for males. Second, the measures of academic

achievement have no impact on the probability of being unemployed for males. However, ASAT math test performance is negatively associated with the probability of being unemployed for females. Third, the impact of academic achievement on the probability of being self-employed is more pronounced for males. Fourth, not only GPA and ASAT math score but also ASAT math and reading national percentile rankings predict a higher probability of having health insurance for males. Interestingly, the results indicate that ASAT reading test performance has a negative impact on subjective health status and is positively associated with the probability of being seriously sick or disabled for females. However, the effects are statistically significant only at the 10 percent level.

Finally, we explore potential differences across immigrant generations. Tables A.5 and A.6 show the estimation results for first- and second-generation immigrants respectively. A comparison of Table A.5 with Table A.6 indicates that the impacts of the measures of academic achievement are similar across the two samples for the following adult outcomes: completed schooling, expected schooling, English writing and reading abilities, job prestige scores and arrest or incarceration history. The major differences between the results based on the first-generation immigrant sample and those based on the second-generation immigrant sample can be summarized as follow: In terms of educational outcomes, we find that ASAT reading score and ASAT reading national percentile ranking have a positive impact on English understanding and speaking abilities of first-generation immigrants while the effects are not statistically significant for second-generation immigrants. Because second-generation immigrants, by definition, were born and grew up in the US, they may differ from first-generation immigrants in terms of self-reported English understanding and speaking abilities. We also find that higher ASAT math national percentile ranking is associated with increased probability of attending school in early adulthood

only for first-generation immigrants. With respect to labor market outcomes, the results indicate that the measures of academic achievement have no impact on personal earnings, probability of being in the labor force, income satisfaction, and the probability of being unemployed for second-generation immigrants and on job satisfaction for first-generation immigrants. In addition, all the measures of academic achievement exert a negative and statistically significant impact on the likelihood of being self-employed for first-generation immigrants. However, for second-generation immigrants only ASAT reading national percentile ranking is a significant predictor of self-employment.

In sum, the results provide evidence that the effect of academic performance on labor market outcomes is stronger for first-generation immigrants than for second-generation immigrants. Two points are worth highlighting in terms of health outcomes. First, the favorable impacts of GPA, ASAT math score and ASAT math national percentile ranking on the probability of being seriously sick or disabled are entirely driven by the second-generation immigrant sample. Second, all the measures of academic achievement predict a higher probability of having health insurance for first-generation immigrants while for second-generation immigrants, only GPA and ASAT math national percentile ranking have a significant effect on the likelihood of having health insurance.

3.2 Relative academic performance and adult outcomes.

A number of studies substantiate the role of aspirations, motivation and effort during childhood in predicting completed schooling, incarceration, and occupational status for immigrant youth (Feliciano & Rumbaut, 2005; Portes et al. 2005; Rumbaut 2005; Portes & Rivas, 2011). Moreover, Portes et al. (2009) and Haller et al. (2011) conclude that adolescent expectations and ambition predict lower likelihood of downward assimilation

for immigrant children.[11]

Taking the previous research as our starting point, we examine a novel hypothesis that the gap in academic performance between middle and high school could have an impact on adult outcomes even after controlling for the levels of academic performance in middle and high school. For instance, an improvement in GPA from middle to high school could be a sign of higher motivation and aspirations, which may translate into better adult outcomes. Moreover, changes in educational performance during the critical years of adolescence could be considered as a measure of immigrant children's adaptation and assimilation. A growing "oppositional culture" among immigrant children, which is described by Zhou (1997) as "resentment toward middle-class America, rebellion against all forms of authority, and rejection of the goals of achievement and upward mobility" usually manifests itself in lower scholastic achievement because high achievers are blamed for "acting white" and complying with the rules set by authority. Therefore, a decline in academic performance could be an indicator of this growing oppositional behavior which may, in turn, predict unfavorable adult outcomes. Conversely, an improvement in academic performance could be an indicator of a higher degree of assimilation and adaptation to the US culture.

We estimate the following model to examine the impact on adult outcomes of changes in academic performance between middle and high school:

$$Y_i = \alpha_0 + \alpha_1 Increase\_in\_GPA_i + \alpha_2 Average\_GPA_i + X_i'\delta + \upsilon_i \tag{2}$$

where Y_i is one of the 20 pecuniary and nonpecuniary adult outcomes for individual i

[11]The authors measure downward assimilation by using a Downward Assimilation Index, which is created by taking into account six outcomes: dropping out of high school, not working or attending school, being under the poverty line, teenage childbearing, and arrest or incarceration.

measured in the third round. Dummy variable, $Increase\_in\_GPA_i$ takes on a value of one if the GPA of student i has increased from middle to high school, and zero otherwise. We include a variable $Average\_GPA_i$, which is the average value of the middle school GPA ($GPA1_i$) and high school GPA ($GPA2_i$) of individual i, to control for the level of GPAs in middle and high school because it is important to hold absolute performances constant to identify the impact of relative performance. We use the average of the GPAs in middle and high school to avoid the potential multicollinearity problem that may arise from including middle and high school GPAs separately.[12] We include the vector of control variables, X_i, from the extended specification presented in Table 5.

Table 9 shows that an improvement in GPA from middle to high school is associated with both higher educational attainment and higher expected educational attainment by age 30. We find that students who raised their GPA from middle to high school completed 0.24 more years of schooling and expect to complete 0.14 more years of schooling by age 30. We also find that an improvement in GPA is positively related to job prestige scores, predicts higher income satisfaction and is negatively associated with the probability of being in the labor force at average age 24. The bottom panel of Table 9 shows that immigrant children who improved their academic performance are more likely to have health insurance, less likely to be sick and report better health in early adulthood.

Consistent with our previous findings, Table 9 indicates that higher $Average\_GPA$ predicts higher completed and expected schooling and higher job prestige scores. $Average\_GPA$ is also positively associated with likelihood of having health insurance and negatively

[12]Dougherty (2007) suggests that if two highly collinear variables (in our case middle and high school GPAs) are conceptually similar, the potential multicollinearity issue could be avoided by including a variable that combines those variables into an overall index. Therefore, we use the average value of middle and high school GPAs rather than including them individually. We also estimate the entire model by including middle and high school GPAs separately, and their sum. The results are not presented here but are similar and available upon request from the authors.

associated with probability of being in the labor force, unemployed and arrested or incarcerated.

In sum, Table 9 provides evidence that relative academic performance of immigrant children in high school compared to middle school, which could be an indicator of change in adolescent aspirations and motivation as well as the degree of adaptation and assimilation to the host country, has an impact on adult outcomes. An improvement in academic achievement is associated with favorable adult outcomes.

Two sensitivity tests are undertaken to examine the robustness of the main findings. First, using the same identification strategy discussed in the robustness checks section, we apply the Heckman correction procedure. We find that our results do not change after correcting for possible sample attrition bias.[13]

Moreover, in the current specification the indicator variable for an improvement in GPA from middle to high school fails to capture the impact of the magnitude of the change in GPAs. For instance, a 0.01 increase in GPA is treated the same as a 1 point increase in GPA. In order to examine the impact of a change in GPA in a continuous fashion, we create a continuous GPA gap variable which is equal to the difference between high school GPA and middle school GPA ($GPA\_gap = GPA2 - GPA1$). The new specification, which is presented in Table 10, leads to two changes in the results presented in Table 9. First, the impact of the GPA_gap variable on the probability of being in the labor force is not statistically significant while the GPA_gap variable has a positive impact on adult earnings. We find that a one-point increase in GPA from middle to high school is associated with a 4.1 percentage point increase in adult earnings. Second, the GPA_gap variable has no impact on the probability of having health insurance and on

[13]The results when we applied the Heckman correction are not presented to conserve space but are available upon request from the authors.

the probability of being sick.

4 Conclusion

This study examines the relationship between education at the intensive margin and twenty pecuniary and nonpecuniary adult outcomes among American immigrant youth. We use middle school standardized math and reading test scores, national percentile rankings on these tests and cumulative grade point averages (GPA) in both middle and high school as measures of education at the intensive margin. The results provide evidence that higher academic achievement in early adolescence predict better adult outcomes.

The impact of immigration on American society continues to be a hot-button issue. Immigrant children are expected to become the center of this debate as they constitute approximately one-quarter of all school-age children in the US. In addition, between late 2013 and August 2014, the US has witnessed an influx of more than 60,000 unaccompanied and undocumented immigrant children who were running away from violence in Central America (Park, 2014). This recent influx of these immigrant children created an emotionally-charged wave of public and political debate (Richinick, 2014). School districts with limited budgets across the US are preparing for large numbers of unaccompanied immigrant children with absent or limited English skills (Lee, 2014). Given the fast-paced growth and the size of the population of immigrant children, our findings have important policy implications in terms of allocating limited resources to programs that foster scholastic potential of these children and prepare them for success later in life.

We also contribute to the literature by examining a novel hypothesis that the relative academic performance of immigrant children in high school compared to middle school, which could be an indicator of change in adolescent aspirations and motivation as well as

the degree of adaptation and assimilation to the host country, could have an impact on adult outcomes. We find that changes in academic performance in high school relative to middle school matter for adult well-being even after controlling for absolute performance. An increase in GPA from middle school to high school is associated with favorable adult outcomes.

An interesting avenue for future research would be to follow the academic performance of immigrant children starting from elementary school in order to explore the impact on adult outcomes of dynamic changes in academic achievement throughout the years in school. Data limitations do not allow us to investigate these relationships in the current study.

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Table 1: Immigrant Children's Country of Origin Classified by First- and Second-Generation.

	First Generation (non-US born)		Second Generation (US born)	
National origin	Frequency	Percent	Frequency	Percent
The Philippines	370	14.08	449	17.07
Cuba	355	13.51	870	33.08
Nicaragua	318	12.10	26	0.99
Mexico	299	11.38	456	17.34
Vietnam	312	11.87	58	2.21
Laos	152	5.78	2	0.08
Colombia	105	4.00	122	4.64
Haiti	101	3.84	77	2.93
Jamaica	94	3.58	62	2.36
Cambodia	91	3.46	3	0.11
Hmong	50	1.90	3	0.11
West Indies	38	1.45	78	2.97
Dominican Republic	35	1.33	70	2.66
Honduras	33	1.26	20	0.76
Argentina	27	1.03	16	0.61
El Salvador	22	0.84	12	0.46
Peru	21	0.80	24	0.91
China	21	0.80	16	0.61
Europe/Canada	20	0.76	68	2.59
Other South America	19	0.72	23	0.87
Chile	18	0.68	12	0.46
Guatemala	17	0.65	14	0.53
Ecuador	15	0.57	20	0.76
Korea	13	0.49	10	0.38
Middle East/Africa	12	0.46	25	0.95
Venezuela	12	0.46	4	0.15
Japan	10	0.38	20	0.76
India	9	0.34	9	0.34
Panama	8	0.30	12	0.46
Hong Kong	8	0.30	9	0.34
Taiwan	7	0.27	11	0.42
Costa Rica	7	0.27	9	0.34
Other Asia	5	0.19	12	0.46
Pakistan	4	0.15	8	0.30
Total	2,628	100	2,630	100

Table 2: Summary Statistics.

Variable	Mean	Standard Deviation	Minimum	Maximum
Round 1				
GPA	2.52	0.91	0	4.96
ln Math score percentile	3.68	0.96	0	4.59
ln Math score	6.54	0.07	6.33	6.75
ln Reading score percentile	3.33	1.11	0	4.59
ln Reading score	6.50	0.06	6.26	6.72
Math score percentile	53.15	29.67	0	99
Math score	693.99	62.03	0	857
Reading score percentile	41.55	27.84	0	99
Reading score	663.68	61.10	0	830
Male	0.49	0.50	0	1
Age	14.23	0.86	12	18
Miami	0.48	0.50	0	1
Fort Lauderdale	0.06	0.24	0	1
San Diego	0.46	0.50	0	1
US-born children	0.50	0.50	0	1
Number of older siblings	1.69	1.98	0	21
8^{th} Grade	0.46	0.49	0	1
Household size	4.23	1.87	0	15
Non-English at home	0.91	0.27	0	1
Biological parents present	0.64	0.48	0	1
Mother < high school	0.32	0.46	0	1
Mother high school	0.25	0.43	0	1
Mother > high school	0.43	0.49	0	1
Father < high school	0.28	0.45	0	1
Father high school	0.24	0.43	0	1
Father > high school	0.47	0.50	0	1
Family economic status	2.21	0.76	1	3
Own home	0.55	0.49	0	1
Father occupational prestige	43.40	14.44	13	78
Mother occupational prestige	43.10	13.93	17	78
Number of friends	13.10	18.43	0	98
Aspire graduate degree	0.66	0.47	0	1
Discriminated	0.55	0.49	0	1
Self-esteem index	3.30	0.52	1	4
Depression index	1.65	0.63	1	4
Desired status	67.36	20.21	17.24	89.57
Desired job prestige	62.33	12.70	13	78
Hours studied	2.48	1.35	1	6
School population	1792.2	764.5	707	3568
Private school	0.04	0.19	0	1
Minority school	0.42	0.49	0	1
Inner-city school	0.37	0.48	0	1
White percent	23.72	19.38	0.1	65
Black percent	15.91	18.77	0	92
Hispanic percent	45.76	33.17	4	99
Asian percent	14.48	17.03	0	45
Subsidized-lunch eligible percent	45.45	24.43	0	92.3
English-speak	3.73	0.54	1	4
English-understand	3.77	0.48	1	4
English-read	3.67	0.55	1	4
English-write	3.64	0.59	1	4

Table 2 (continued): Summary Statistics.

Variable	Mean	Standard Deviation	Minimum	Maximum
Round 2				
Surveyed	0.81	0.38	0	1
GPA	2.46	0.95	0	5
Self-esteem index	3.40	0.51	1	4
Depression index	1.66	0.64	1	4
Hours studied	2.74	1.46	1	6
School population	2522.9	1068.4	227	4930
Private school	0.04	0.18	0	1
School dropout rate	5.51	4.13	0.2	27.6
School percent attend	93.01	1.98	88.3	96
Subjective school quality	2.93	0.457	1.2	4
Round 3				
Educational outcomes				
Completed schooling	14.32	1.82	10	18
In school	0.51	0.49	0	1
Expected schooling by 30	16.75	1.48	12	18
English-read	3.87	0.39	1	4
English-understand	3.90	0.34	1	4
English-speak	3.87	0.39	1	4
English-write	3.79	0.48	1	4
Labor market outcomes				
ln personal earnings	7.31	0.68	3.91	9.74
In labor force	0.90	0.29	0	1
Unemployed	0.09	0.29	0	1
Self-employed	0.05	0.22	0	1
Income satisfaction	3.16	1.11	1	5
Job satisfaction	3.80	1.05	1	5
First job prestige score	39.76	11.59	16	78
Job prestige score	44.54	11.81	16	78
Expected job prestige score by 30	54.77	10.33	18	78
Health and social outcomes				
Health insurance	0.74	0.44	0	1
Subjective health	4.21	0.84	1	5
Sick (ill or disabled)	0.06	0.24	0	1
Arrested or incarcerated	0.07	0.23	0	1

Table 3: Summary Statistics Comparison by Different Rounds of Surveys.

Variable	Round 1 sample (Full sample)		Round 3 sample	
	Mean	Standard Deviation	Mean	Standard Deviation
Round 1 variables				
GPA	2.52	0.91	2.67	0.88
ln Math score percentile	3.68	0.96	3.79	0.90
ln Math score	6.54	0.07	6.55	0.07
ln Reading score percentile	3.33	1.11	3.48	1.04
ln Reading score	6.50	0.06	6.51	0.06
Math score percentile	53.15	29.67	57.06	29.26
Math score	693.99	62.03	700.38	58.49
Reading score percentile	41.55	27.84	45.67	27.76
Reading score	663.68	61.10	669.32	59.90
Male	0.49	0.50	0.46	0.50
Age	14.23	0.86	14.16	0.84
Miami	0.48	0.50	0.45	0.50
Fort Lauderdale	0.06	0.24	0.05	0.23
San Diego	0.46	0.50	0.45	0.49
US-born children	0.50	0.50	0.53	0.50
Number of older siblings	1.69	1.98	1.64	1.87
8^{th} Grade	0.46	0.49	0.46	0.49
Household size	4.23	1.87	4.20	1.83
Non-English at home	0.91	0.27	0.91	0.28
Biological parents present	0.64	0.48	0.69	0.46
Mother < high school	0.32	0.46	0.29	0.45
Mother high school	0.25	0.43	0.24	0.43
Mother > high school	0.43	0.49	0.46	0.50
Father < high school	0.28	0.45	0.26	0.44
Father high school	0.24	0.43	0.23	0.42
Father > high school	0.47	0.50	0.51	0.50
Family economic status	2.21	0.76	2.24	0.75
Own home	0.55	0.49	0.61	0.49
Father occupational prestige	43.40	14.44	43.95	14.43
Mother occupational prestige	43.10	13.93	44.00	13.61
Number of friends	13.10	18.43	12.77	17.96
Aspire graduate degree	0.66	0.47	0.69	0.46
Discriminated	0.55	0.49	0.55	0.49
Self-esteem index	3.30	0.52	3.31	0.52
Depression index	1.65	0.63	1.63	0.62
Desired status	67.36	20.21	68.44	19.70
Desired job prestige	62.33	12.70	63.14	12.31
Hours studied	2.48	1.35	2.54	1.35
School population	1792.2	764.5	2.52	0.91
Private school	0.04	0.19	0.04	0.20
Minority school	0.42	0.49	0.43	0.49
Inner-city school	0.37	0.48	0.33	0.47
White percent	23.72	19.38	24.14	19.55
Black percent	15.91	18.77	14.76	17.17
Hispanic percent	45.76	33.17	46.28	33.39
Asian percent	14.48	17.03	14.71	17.26
Subsidized-lunch eligible percent	45.45	24.43	43.84	24.24
English-speak	3.73	0.54	3.79	0.46
English-understand	3.77	0.48	3.82	0.42
English-read	3.67	0.55	3.74	0.50
English-write	3.64	0.59	3.70	0.54

Table 4: Academic Performance in Middle School and Completed Years of Schooling.

GPA	0.998**				
	(26.91)				
ln Math score percentile		0.676**			
		(11.66)			
ln Math score			10.33**		
			(17.36)		
ln Reading score percentile				0.573**	
				(11.07)	
ln Reading score					10.89**
					(15.01)
Male	0.040	-0.223*	-0.237**	-0.194+	-0.208*
	(0.46)	(2.21)	(2.69)	(1.87)	(2.20)
Age	0.063	-0.378	-0.256	-0.423	-0.099
	(0.06)	(0.42)	(0.27)	(0.42)	(0.10)
Age-squared/100	-1.229	0.187	-0.165	0.290	-0.828
	(0.35)	(0.06)	(0.05)	(0.08)	(0.24)
Number of older siblings	-0.040*	-0.055**	-0.046*	-0.049*	-0.040*
	(2.32)	(2.95)	(2.25)	(2.45)	(2.02)
Miami	0.467*	0.064	0.146	0.257	0.426*
	(2.43)	(0.30)	(0.73)	(1.31)	(2.25)
Ft. Lauderdale	0.221	-0.028	0.026	0.041	0.141
	(0.89)	(0.11)	(0.11)	(0.17)	(0.60)
8^{th} Grade	0.503**	0.510**	0.286**	0.535**	0.400**
	(4.88)	(4.97)	(3.14)	(5.30)	(4.38)
US-born	0.268**	0.148*	0.120+	0.070	0.063
	(3.95)	(2.10)	(1.71)	(0.97)	(0.88)
Country-of-origin dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.316	0.214	0.239	0.208	0.220
N			3264		

Notes: Regression of completed years of schooling on middle school variables in each column. t-statistics are reported in parentheses and are in absolute values together with the coefficients that are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 5: Academic Performance in Middle School and Completed Years of Schooling in Extended Specification.

GPA	0.743**				
	(21.97)				
ln Math score percentile		0.429**			
		(8.86)			
ln Math score			6.599**		
			(12.73)		
ln Reading score percentile				0.368**	
				(9.43)	
ln Reading score					6.951**
					(12.52)
US-born	0.106	0.029	0.021	-0.011	-0.009
	(1.57)	(0.41)	(0.30)	(0.16)	(0.13)
Household size	-0.046*	-0.034*	-0.035*	-0.027	-0.028+
	(2.94)	(2.16)	(2.32)	(1.62)	(1.19)
Biological parents present	0.172**	0.220**	0.192**	0.247**	0.242**
	(2.97)	(3.37)	(2.97)	(3.81)	(3.77)
Non-English at home	-0.005	-0.001	-0.007	0.043	0.043
	(0.04)	(0.01)	(0.06)	(0.33)	(0.33)
Mother high school	0.023	0.055	0.027	0.071	0.052
	(0.18)	(0.47)	(0.24)	(0.59)	(0.42)
Mother > high school	0.279*	0.320**	0.289*	0.318**	0.303*
	(2.58)	(2.99)	(2.67)	(2.81)	(2.65)
Father high school	-0.077	-0.087	-0.066	-0.084	-0.082
	(0.71)	(0.75)	(0.57)	(0.71)	(0.67)
Father > high school	0.039	0.051	0.055	0.038	0.034
	(0.51)	(0.67)	(0.72)	(0.47)	(0.41)
Middle Income	0.061	0.104	0.093	0.122	0.116
	(0.68)	(1.25)	(1.16)	(1.55)	(1.47)
High Income	0.061	0.073	0.073	0.098	0.094
	(0.71)	(0.85)	(0.87)	(1.21)	(1.15)
Own home	0.258**	0.230*	0.210*	0.196*	0.195*
	(2.91)	(2.60)	(2.38)	(2.07)	(2.07)
Father occupational prestige	0.006**	0.006**	0.006**	0.007**	0.006**
	(2.84)	(2.91)	(2.81)	(3.13)	(2.83)
Mother occupational prestige	0.005*	0.005*	0.005*	0.005*	0.005*
	(2.56)	(2.11)	(2.28)	(2.26)	(2.05)
Number of friends	-0.0006	-0.003	-0.003	-0.003	-0.002
	(0.32)	(1.51)	(1.29)	(1.26)	(1.02)
Aspire graduate degree	0.241**	0.322**	0.314**	0.329**	0.315**
	(3.44)	(4.48)	(4.31)	(4.45)	(4.29)
Discriminated	-0.024	-0.060	-0.049	-0.077	-0.071
	(0.36)	(0.86)	(0.73)	(1.12)	(1.04)
Self-esteem	0.101*	0.152**	0.130*	0.104+	0.087
	(2.09)	(2.91)	(2.45)	(1.95)	(1.67)
Depression	-0.011	-0.068	-0.075+	-0.096*	-0.112*
	(0.28)	(1.60)	(1.77)	(2.14)	(2.52)
Desired status	0.004	0.004	0.004	0.005+	0.005+
	(1.41)	(1.55)	(1.50)	(1.87)	(1.87)
Desired prestige	0.002	0.004	0.004	0.002	0.002
	(0.53)	(0.84)	(0.90)	(0.46)	(0.53)
Minority school	-0.172	-0.377*	-0.396**	-0.454**	-0.475**
	(1.16)	(2.66)	(2.83)	(3.06)	(4.10)
Inner-city school	-0.073	-0.044	-0.044	-0.092	-0.072
	(0.84)	(0.40)	(0.41)	(0.95)	(0.73)
White percent	0.091	0.120	0.126	0.119	0.125
	(1.10)	(1.07)	(1.20)	(1.00)	(1.12)
Black percent	0.085	0.116	0.123	0.118	0.124
	(1.03)	(1.03)	(1.17)	(0.99)	(1.11)
Hispanic percent	0.087	0.117	0.125	0.119	0.125
	(1.05)	(1.04)	(1.18)	(1.00)	(1.12)
Asian percent	0.092	0.121	0.131	0.122	0.130
	(1.11)	(10.7)	(1.23)	(1.01)	(1.15)
Subsidized-lunch eligible	0.002	0.003	0.004	0.003	0.003
	(0.63)	(0.88)	(1.00)	(0.67)	(0.91)
School population(1)/100	0.016	0.008	0.007	-0.006	0.007
	(1.60)	(0.88)	(0.73)	(0.54)	(0.65)
Hours studied(1)	-0.001	0.050*	0.044+	0.052*	0.048*
	(0.09)	(2.15)	(1.95)	(2.23)	(2.08)
School population(2)/100	0.006	0.010+	0.010*	0.008+	0.0009*
	(1.35)	(1.98)	(2.02)	(1.72)	(2.02)
Hours studied(2)	0.122**	0.177**	0.167**	0.184**	0.182**
	(5.04)	(7.70)	(7.28)	(8.45)	(8.24)
Private school(1)	0.727	1.889+	0.768+	0.829+	0.846+
	(1.55)	(1.98)	(1.79)	(1.84)	(2.00)
Private school(2)	0.267	0.394+	0.392	0.372	0.282
	(1.24)	(1.72)	(1.60)	(1.44)	(1.22)
School dropout rate(2)	-0.013	-0.016	-0.015	-0.019	-0.016
	(0.97)	(1.13)	(1.10)	(1.66)	(1.31)
School percent attend(2)	-0.017	-0.007	-0.011	-0.020	-0.012
	(0.57)	(0.23)	(0.35)	(0.58)	(0.38)
Subjective school quality(2)	0.081	0.147*	0.127+	0.147*	0.141*
	(1.35)	(2.33)	(2.01)	(2.52)	(2.39)
Controls in Table 2	Yes	Yes	Yes	Yes	Yes
Country-of-origin dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.391	0.344	0.352	0.341	0.345
N			3264		

Notes: Regression of completed years of schooling on independent variables measured in middle and high school in each column. Variables measured in round 1 (middle school) have either no number attached to them or a suffix of (1) attached to them. Variables measured in round 2 (high school) have a suffix of (2) attached to them. t-statistics are reported in parentheses and are in absolute values together with the coefficients that are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 6: Academic Performance in Middle School and Adult Outcomes in Basic Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.998**	0.043**	0.533**	0.016+	0.009	0.006	0.025*
	(26.91)	(3.59)	(12.15)	(1.88)	(1.29)	(0.84)	(2.21)
ln Math score percentile	0.676**	0.048**	0.406**	0.029**	0.023**	0.017+	0.026*
	(11.66)	(3.83)	(10.53)	(2.57)	(2.57)	(1.94)	(2.11)
ln Math score	10.33**	0.329*	5.453**	0.311*	0.258**	0.173+	0.374**
	(17.36)	(2.04)	(14.30)	(2.25)	(2.63)	(1.79)	(2.61)
ln Reading score percentile	0.573**	0.027**	0.290**	0.063**	0.046**	0.045**	0.071**
	(11.07)	(3.07)	(8.00)	(5.44)	(4.63)	(4.18)	(5.20)
ln Reading score	11.89**	0.257	5.390**	0.978**	0.713**	0.718**	1.203**
	(15.01)	(1.52)	(10.90)	(5.28)	(4.72)	(4.38)	(5.40)
N	3264	3233	2465	3177	3181	3183	2716

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	0.009	-0.032**	-0.020**	-0.009	-0.010	0.015
	(0.50)	(4.14)	(2.75)	(1.51)	(0.47)	(0.69)
ln Math score percentile	0.050**	-0.016+	-0.016*	-0.008+	0.023	0.052**
	(2.63)	(1.78)	(2.10)	(1.66)	(1.02)	(2.72)
ln Math score	0.698*	-0.278**	-0.211+	-0.127+	0.363	0.614*
	(2.31)	(2.99)	(1.86)	(1.78)	(1.07)	(2.21)
ln Reading score percentile	0.048**	-0.011	-0.017**	-0.012**	-0.023	-0.009
	(2.95)	(1.60)	(2.96)	(2.68)	(0.95)	(0.54)
ln Reading score	0.815**	-0.246*	-0.272**	-0.255**	-0.609	-0.085
	(2.91)	(2.07)	(2.83)	(2.67)	(1.54)	(0.29)
N	2603	3262	2829	2669	2939	2828

	job prestige score	first job prestige	expected job prestige
GPA	3.349**	3.539**	2.926**
	(14.68)	(11.61)	(13.38)
ln Math score percentile	1.826**	2.148**	1.773**
	(7.69)	(8.52)	(6.25)
ln Math score	30.587**	38.829**	31.081**
	(7.94)	(10.99)	(11.03)
ln Reading score percentile	1.660**	1.920**	1.727**
	(6.60)	(7.32)	(6.78)
ln Reading score	32.059**	38.936**	34.823**
	(5.72)	(8.14)	(9.24)
N	2591	2393	2869

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.060**	0.695**	-0.013*	-0.038**
	(5.56)	(3.62)	(2.53)	(5.62)
ln Math score percentile	0.048**	0.040*	-0.012*	-0.016**
	(4.70)	(1.95)	(2.16)	(2.69)
ln Math score	0.749**	0.867**	-0.235**	-0.271**
	(5.24)	(3.79)	(3.90)	(3.51)
ln Reading score percentile	0.038**	0.041*	0.0005	-0.008*
	(4.59)	(2.40)	(0.97)	(1.80)
ln Reading score	0.602**	1.000**	0.011	-0.174**
	(3.81)	(3.45)	(0.13)	(2.14)
N	3272	3302	3158	3049

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 4. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 7: Academic Performance in Middle School and Adult Outcomes in Extended Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.743**	0.015	0.349**	-0.004	-0.004	-0.007	0.001
	(21.97)	(0.91)	(7.93)	(0.41)	(0.47)	(0.66)	(0.01)
ln Math score percentile	0.429**	0.035*	0.241**	0.011	0.009	0.002	0.006
	(8.86)	(2.29)	(5.66)	(0.93)	(1.07)	(0.29)	(0.47)
ln Math score	6.599**	0.026	3.179**	0.042	0.081	-0.019	0.050
	(12.73)	(0.12)	(6.66)	(0.23)	(0.86)	(0.20)	(0.34)
ln Reading score percentile	0.368**	0.015	0.165**	0.051**	0.036**	0.032**	0.056**
	(9.43)	(1.33)	(6.13)	(4.07)	(3.21)	(2.74)	(3.95)
ln Reading score	6.951**	-0.051	3.195**	0.758**	0.527**	0.508**	0.921**
	(12.52)	(0.24)	(7.77)	(4.47)	(3.64)	(3.36)	(4.81)
N	3264	3233	2465	3177	3181	3183	2716

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	0.0003	-0.019**	-0.016+	-0.008	-0.034	-0.011
	(0.02)	(2.56)	(1.89)	(1.23)	(1.48)	(0.36)
ln Math score percentile	0.046*	-0.004	-0.011	-0.009*	0.010	0.041+
	(2.67)	(0.53)	(1.43)	(2.06)	(0.46)	(1.87)
ln Math score	0.620*	-0.095	-0.117	-0.129+	0.159	0.396
	(2.22)	(1.12)	(1.08)	(1.81)	(0.44)	(1.21)
ln Reading score percentile	0.042**	0.001	-0.011*	-0.014**	-0.032	-0.028
	(2.71)	(0.03)	(2.03)	(3.13)	(1.27)	(1.47)
ln Reading score	0.635*	-0.018	-0.161	-0.277**	-0.778+	-0.343
	(2.33)	(0.17)	(1.42)	(2.89)	(1.85)	(0.90)
N	2603	3242	2781	2612	2939	2828

	job prestige score	first job prestige	expected job prestige
GPA	2.441**	2.544**	2.056**
	(10.64)	(8.20)	(9.07)
ln Math score percentile	1.002**	1.203**	1.051**
	(5.39)	(4.64)	(4.01)
ln Math score	17.939**	25.110**	20.318**
	(5.37)	(6.42)	(7.89)
ln Reading score percentile	0.903**	1.097**	1.102**
	(3.84)	(4.30)	(4.01)
ln Reading score	18.087**	24.587**	23.556**
	(3.22)	(4.81)	(5.66)
N	2591	2393	2869

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.038**	0.008	-0.010*	-0.021**
	(2.98)	(0.34)	(2.01)	(3.39)
ln Math score percentile	0.033**	-0.003	-0.010+	-0.004
	(3.66)	(0.16)	1.80)	(0.75)
ln Math score	0.478**	0.210	-0.219**	-0.098
	(3.46)	(0.86)	(3.24)	(1.21)
ln Reading score percentile	0.023**	-0.001	0.007	0.001
	(2.68)	(0.01)	(1.19)	(0.07)
ln Reading score	0.276	0.316	0.053	-0.013
	(1.58)	(0.98)	(0.63)	(0.19)
N	3272	3302	3142	3049

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 8: Heckman Selection Correction: Academic Performance in Middle School and Adult Outcomes in Extended Specification.

	completed schooling	English write	ln personal earnings	income satisfaction	expected job prestige	arrested or incarcerated
GPA	0.699**	0.039	0.029	0.109	1.345*	0.006
	(8.04)	(1.14)	(0.54)	(1.33)	(2.06)	(0.41)
λ	-0.455	0.611	0.176	**1.131***	-6.748	**0.170**$^{+}$
	(0.72)	(1.37)	(0.50)	(1.97)	(1.47)	(1.75)
Change in living conditions	-0.159**	-0.144*	-0.127*	-0.145*	-0.141*	-0.162**
	(2.74)	(2.35)	(2.09)	(2.45)	(2.33)	(2.77)
ln Math score percentile	0.403**	0.021	0.004	0.048	0.532	0.005
	(7.61)	(0.60)	(0.10)	(1.10)	(1.26)	(0.59)
λ	-0.702	0.228	-0639	0.665	**-9.146**$^{+}$	0.137
	(1.02)	(1.00)	(1.61)	(1.15)	(1.85)	(1.36)
Change in living conditions	-0.177**	-0.162**	-0.144*	-0.162**	-0.161**	-0.0175**
	(3.06)	(2.66)	(2.37)	(2.74)	(2.67)	(3.01)
ln Math score	5.577**	0.217	-0.190	0.613	10.992^{+}	0.089
	(7.03)	(0.77)	(0.38)	(0.98)	(1.83)	(0.79)
λ	**-0.309**$^{+}$	0.241	**-0.710**$^{+}$	0.551	**-10.816***	0.143
	(1.89)	(1.10)	(1.83)	(0.98)	(2.20)	(1.45)
Change in living conditions	-0.177**	-0.161**	-0.143*	-0.162**	0.159**	-0.174**
	(3.05)	(2.65)	(2.35)	(2.73)	(2.64)	(2.99)
ln Reading score percentile	0.387**	0.085**	-0.003	0.013	0.747	0.011
	(6.33)	(3.86)	(0.07)	(0.24)	(1.52)	(1.22)
λ	0.201	**0.388**$^{+}$	-0.487	0.558	-3.787	0.169
	(0.29)	(1.65)	(1.23)	(0.95)	(0.79)	(1.62)
Change in living conditions	-0.165**	-0.151*	-0.132*	-0.150*	-0.147*	-0.164**
	(2.84)	(2.47)	(2.17)	(2.53)	(2.43)	(2.81)
ln Reading score	6.528**	1.388**	-0.426	0.029	15.464^{+}	0.162
	(5.80)	(3.38)	(0.59)	(0.03)	(1.80)	(1.64)
λ	-0.360	0.289	-0.565	0.519	-4.560	-0.004
	(0.55)	(1.34)	(1.52)	(0.93)	(1.00)	(0.41)
Change in living conditions	-0.167**	-0.154*	-0.135*	-0.153**	-0.149*	-0.166**
	(2.88)	(2.52)	(2.22)	(2.58)	(2.47)	(2.85)
N	2934	2466	2340	2632	2579	2888

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. z-statistics are reported in parentheses and are in absolute values. λ is the inverse Mills ratio. **, * and $^{+}$ indicate respectively 1%, 5% and 10% significance levels.

Table 9: Increase in Academic Performance in High School Relative to Middle School and Adult Outcomes

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
Average GPA	0.887**	0.015	0.425**	-0.009	-0.004	-0.006	-0.006
	(22.58)	(0.91)	(7.93)	(0.84)	(0.50)	(0.64)	(0.44)
Increase in GPA	0.240**	0.008	0.139*	0.016	0.011	0.008	0.012
	(2.92)	(0.42)	(2.47)	(0.95)	(0.70)	(0.38)	(0.62)
N	2920	2891	2207	2859	2863	2864	2457

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
Average GPA	0.017	-0.026**	-0.0203*	-0.006	-0.011	-0.002
	(0.88)	(3.27)	(2.38)	(0.83)	(0.36)	(0.05)
Increase in GPA	0.023	-0.027*	-0.007	0.004	0.106+	0.049
	(0.85)	(2.36)	(0.61)	(0.68)	(1.81)	(1.01)
N	2334	2895	2479	2269	2620	2525

	job prestige score	first job prestige	expected job prestige
Average GPA	3.349**	3.132**	2.633**
	(12.66)	(8.59)	(10.49)
Increase in GPA	1.281*	1.151+	1.071*
	(2.21)	(1.87)	(2.27)
N	2311	2122	2573

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
Average GPA	0.042**	0.028	-0.007	-0.022**
	(3.36)	(1.26)	(1.18)	(2.95)
Increase in GPA	0.040*	0.094**	-0.015*	-0.007
	(2.38)	(3.92)	(2.09)	(0.82)
N	2927	2953	2725	2702

Notes: Regression of adult outcomes on the average of middle school GPA (GPA1) and high school GPA (GPA2), the increase in GPA from middle to high school and controls from the extended specification of Table 5. The omitted category is having the same GPA in both middle and high school or having experienced a decline in GPA from middle to high school. Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 10: Continuous Gap in Academic Performance between High School and Middle School and Adult Outcomes

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
Average GPA	0.887**	0.016	0.421**	-0.008	-0.005	-0.006	-0.006
	(22.29)	(0.96)	(7.78)	(0.80)	(0.51)	(0.60)	(0.37)
GPA gap (GPA2-GPA1)	0.163**	-0.002	0.151*	0.007	0.010	0.004	0.001
	(2.91)	(0.11)	(2.48)	(0.53)	(0.75)	(0.28)	(0.03)
N	2920	2891	2207	2859	2863	2864	2457

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
Average GPA	0.016	-0.027**	-0.023*	-0.006	-0.013	-0.005
	(0.81)	(3.45)	(2.42)	(0.82)	(0.43)	(0.16)
GPA gap (GPA2-GPA1)	0.041+	-0.013	-0.004	0.004	0.093*	0.078*
	(1.85)	(1.35)	(0.47)	(0.59)	(2.58)	(2.43)
N	2334	2895	2479	2269	2620	2525

	job prestige score	first job prestige	expected job prestige
Average GPA	3.350**	3.123**	2.659**
	(12.77)	(8.65)	(10.43)
GPA gap (GPA2-GPA1)	0.880*	0.806	0.455
	(2.28)	(1.33)	(1.27)
N	2311	2122	2573

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
Average GPA	0.043**	0.029	-0.007	-0.021**
	(3.43)	(1.30)	(1.30)	(2.90)
GPA gap (GPA2-GPA1)	0.018	0.054*	0.002	-0.008
	(1.34)	(2.47)	(0.29)	(1.06)
N	2927	2953	2725	2702

Notes: Regression of adult outcomes on the average of middle school GPA (GPA1) and high school GPA (GPA2), the continuous gap in GPA between high and middle school, and controls from the extended specification of Table 5. Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

APPENDIX

Table A.1: Variable Definitions.

Variable name	Definition
GPA	Grade point average from schools' records.
Math score percentile	National percentile rank on Stanford Math Achievement Test.
Math score	Total score on Stanford Math Achievement Test.
Reading score percentile	National percentile rank on Stanford Reading Achievement Test
Reading score	Total score on Stanford Reading Achievement Test.
Male	Dummy for male.
Age	Respondent age in years.
Miami	First interview site, dummy for Miami.
Fort Lauderdale	First interview site, dummy for Ft. Lauderdale.
San Diego	First interview site, dummy for San Diego.
US-born children	Respondent's country of birth, dummy for US-born.
Number of older siblings	Total number of older siblings.
Household size	Total number of household members.
Mother's highest education	Coded as indicator variables: less than high school, high school, more than high school degree.
Father's highest education	Coded as indicator variables: less than high school, high school, more than high school degree.
Non-English at home	Dummy for speaking a language other than English at home.
8^{th} Grade	Student's grade, dummy variable for 8^{th} grade.
Biological parents present	Present living situation & household guardians, dummy for living with two biological parents.
Family economic status	Family economic status, coded as three dummies: lower if working-class/poor; middle if middle-class; upper if wealthy/upper-middle class.
Home ownership	Parents (or adult guardians) own home, dummy for home ownership.
Father occupational prestige	Father Occupational Prestige Score-Treiman Scale.
Mother occupational prestige	Mother Occupational Prestige Score-Treiman Scale.
Number of friends	Number of close friends at school.
Aspire graduate degree	Respondent's education aspiration, dummy for aspiring to finish a graduate degree.
Discriminated	Respondent ever felt discriminated against, dummy for having felt discriminated against.
Self-esteem index	Self-esteem indices are created for both rounds 1 and 2 by taking the average of 10 items. I am a person of worth, I have a number of good qualities, I'm inclined to feel I'm a failure (reversed scale), I do things as well as other people, I do not have much to be proud of (reversed scale), I take a positive attitude toward myself, I am satisfied with myself, I wish I had more respect for myself (reversed scale), I certainly feel useless at times (reversed scale), At times I think I am no good at all (reversed scale). 1 = Disagrees a lot; 2 = Disagrees a little, 3 = Agrees a little; 4 = Agrees a lot.
Depression index	Depression indices are created for both rounds 1 and 2 by taking the average of 4 items. Felt sad past week Could not get going past week, Did not feel like eating past week, I felt depressed past week. 1 = Rarely, 2 = Some of the time; 3 = Occasionally; 4 = Most of the time.
Desired status	Respondent's desired job Socio-Economic Index.
Desired job prestige	Respondent's desired Job Prestige Score (Treiman Scale).
Minority school	Minority school, dummy if 60% or more in school Black/Hispanic.
Inner-city school	School type attended, dummy for inner city (control group suburban).
White percent	Percent of school population that is White.
Black percent	Percent of school population that is Black.
Hispanic percent	Percent of school population that is Hispanic.
Asian percent	Percent of school population that is Asian.
Subsidized-lunch eligible %	Percent of school population who are eligible for subsidized lunch at school.
Hours studied	Hours spent studying/doing schoolwork or homework during a typical weekday.
Private school	Dummy for private school.
School population	Total school population.
English-speak	How well do you speak English? 1=not at all; 2=not well; 3=well; 4=very well.
English-understand	How well do you understand English? 1=not at all; 2=not well; 3=well; 4=very well.
English-read	How well do you read English? 1=not at all; 2=not well; 3=well; 4=very well.
English-write	How well do you write English? 1=not at all; 2=not well; 3=well; 4=very well.
School dropout rate	Annual dropout rate based on school records.
School percent attend	Percent daily attendance at school based on school records.
Subjective school quality	Subjective school quality index is created by taking the average of 10 items: There is real school spirit, Students make friends with students of other racial and ethnic groups, The teaching is good, Teachers are interested in students, I don't feel safe at this school (reversed scale), Disruptions by other students get in the way of learning (reversed scale), Fights often occur between different racial or ethnic groups (reversed scale), There are many gangs in school (reversed scale), Students are graded fairly, Discipline is fair. 1=Disagrees a lot; 2=Disagrees a little, 3=Agrees a little; 4=Agrees a lot.
Educational outcomes	
Completed schooling	Highest grade or year of school completed.
In school	Currently in school, dummy for being in school.
Expected schooling by 30	Highest level of education one realistically expects to have achieved by age 30.
English-speak	How well do you speak English? 1=not at all; 2=not well; 3=well; 4=very well.
English-understand	How well do you understand English? 1=not at all; 2=not well; 3=well; 4=very well.
English-read	How well do you read English? 1=not at all; 2=not well; 3=well; 4=very well.
English-write	How well do you write English? 1=not at all; 2=not well; 3=well; 4=very well.
Labor market outcomes	
ln personal earnings	Logarithm of total personal earnings per month from all sources.
In labor force	Dummy for currently in labor force. Coded from present work situation question.
Unemployed	Dummy for currently unemployed. Coded from present work situation question.
Self-employed	Dummy for self-employed.
Income satisfaction	Current income satisfaction. min=1, max=5.
Job satisfaction	Current job satisfaction. min=1, max=5.
First job prestige score	First job prestige score (Treiman).
Job prestige score	Current job prestige score (Treiman).
Expected job prestige by 30	Expected job prestige score (Treiman) by age 30.
Health & social outcomes	
Health insurance	Respondent has health insurance, dummy variable.
Subjective health	Respondent's subjective health. poor=1; fair=2; good=3; very good=4; excellent=5.
Sick (ill or disabled)	Respondent became seriously ill or disabled during the last 5 years, dummy variable.
Arrested or incarcerated	Average of two dummies: I was arrested during the last 5 years; I spent time in a reform school, detention center, jail, or prison during the last 5 years.

Notes: This table provides the definitions of the variables used in the analysis.

Table A.2: Correlations Between Measures of Academic Performance.

	Middle school GPA (GPA1)	ln Math score percentile	ln Math score	ln Reading score percentile	ln Reading score	High school GPA (GPA2)
Middle school GPA (GPA1)	1.000					
ln Math score percentile	0.438	1.000				
ln Math score	0.550	0.829	1.000			
ln Reading score percentile	0.304	0.603	0.552	1.000		
ln Reading score	0.404	0.545	0.637	0.879	1.000	
High school GPA (GPA2)	0.807	0.398	0.539	0.285	0.409	1.000

Table A.3: Male Sample: Academic Performance in Middle School and Adult Outcomes in Extended Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.652**	0.018	0.367**	-0.009	-0.007	-0.003	0.009
	(15.12)	(0.87)	(5.65)	(0.57)	(0.57)	(0.20)	(0.40)
ln Math score percentile	0.365**	0.030	0.351**	0.017	0.015	0.014	0.009
	(4.49)	(1.28)	(5.70)	(0.97)	(1.22)	(1.12)	(0.47)
ln Math score	6.529**	-0.122	4.648**	0.095	0.152	0.167	0.082
	(7.83)	(0.40)	(6.71)	(0.47)	(1.01)	(1.40)	(0.35)
ln Reading score percentile	0.308**	0.008	0.212**	0.047**	0.041**	0.035+	0.053**
	(4.46)	(0.54)	(3.90)	(3.70)	(2.62)	(1.92)	(3.17)
ln Reading score	5.896**	-0.172	3.758**	0.781**	0.541*	0.545*	0.936**
	(6.36)	(0.55)	(4.42)	(3.52)	(2.35)	(2.16)	(3.27)
N	1487	1445	1117	1457	1459	1459	1204

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	0.004	-0.017*	-0.017	-0.006	-0.025	0.006
	(0.18)	(2.01)	(1.61)	(0.73)	(0.68)	(0.16)
ln Math score percentile	0.031	-0.010	-0.001	-0.019**	0.006	0.051
	(1.18)	(1.18)	(0.11)	(2.83)	(0.18)	(1.34)
ln Math score	0.455	-0.125	-0.029	-0.183	1.551	0.512
	(1.36)	(1.33)	(0.21)	(1.61)	(0.24)	(0.87)
ln Reading score percentile	-0.006	-0.005	-0.009	-0.024**	-0.039	-0.001
	(0.22)	(0.93)	(1.08)	(3.34)	(0.94)	(0.01)
ln Reading score	-0.144	-0.058	-0.063	-0.462**	-0.786	0.150
	(0.39)	(0.51)	(0.36)	(3.45)	(0.92)	(0.26)
N	1211	1329	1258	1160	1373	1329

	job prestige score	first job prestige	expected job prestige
GPA	2.337**	2.195**	2.025**
	(6.33)	(5.61)	(5.44)
ln Math score percentile	1.082**	0.913*	0.782+
	(3.55)	(2.18)	(1.71)
ln Math score	21.256**	22.200**	19.406**
	(4.48)	(3.55)	(3.49)
ln Reading score percentile	0.770*	0.898**	0.818+
	(2.31)	(3.22)	(1.97)
ln Reading score	16.948*	20.793**	15.974*
	(2.41)	(3.36)	(2.35)
N	1222	1128	1322

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.042*	0.035	-0.009	-0.035**
	(2.54)	(1.15)	(1.27)	(2.91)
ln Math score percentile	0.051**	-0.027	-0.010+	-0.009
	(3.15)	(1.10)	(1.70)	(0.79)
ln Math score	0.608**	-0.245	-0.257**	-0.167
	(2.62)	(0.70)	(2.65)	(1.03)
ln Reading score percentile	0.036*	-0.023	0.005	0.001
	(2.16)	(0.68)	(0.64)	(0.20)
ln Reading score	0.421	-0.241	0.055	-0.082
	(1.17)	(0.46)	(0.45)	(0.71)
N	1467	1503	1301	1388

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table A.4: Female Sample: Academic Performance in Middle School and Adult Outcomes in Extended Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.823**	0.026	0.363**	-0.003	-0.004	-0.014	-0.010
	(15.27)	(1.19)	(7.36)	(0.20)	(0.26)	(0.99)	(0.51)
ln Math score percentile	0.467**	0.049**	0.179**	0.005	0.006	-0.006	0.001
	(6.90)	(2.71)	(2.99)	(0.31)	(0.36)	(0.39)	(0.07)
ln Math score	6.438**	0.248	2.247**	-0.007	0.012	-0.203	-0.044
	(8.32)	(1.10)	(4.38)	(0.04)	(0.08)	(1.22)	(0.23)
ln Reading score percentile	0.399**	0.026*	0.170**	0.042*	0.031+	0.028+	0.055**
	(7.95)	(1.98)	(4.08)	(2.39)	(2.85)	(1.68)	(2.71)
ln Reading score	7.593**	0.093	3.360**	0.733**	0.527**	0.478*	0.868**
	(12.63)	(0.37)	(5.05)	(3.24)	(2.77)	(2.30)	(3.29)
N	1777	1762	1348	1720	1722	1724	1512

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	-0.006	-0.017	-0.015	-0.004	-0.043	-0.024
	(0.24)	(1.49)	(1.48)	(1.04)	(1.02)	(0.54)
ln Math score percentile	0.045+	-0.005	-0.016*	-0.001	0.001	0.030
	(1.99)	(0.37)	(2.01)	(0.55)	(0.01)	(0.83)
ln Math score	0.538	-0.142	-0.194+	-0.034	0.093	0.355
	(1.59)	(1.05)	(1.72)	(1.30)	(0.16)	(0.67)
ln Reading score percentile	0.071*	0.006	-0.009	-0.006**	-0.021	-0.048
	(2.53)	(0.80)	(1.32)	(2.58)	(0.61)	(1.61)
ln Reading score	1.119*	-0.030	-0.199	-0.098	-0.683	-0.616
	(2.17)	(0.19)	(1.54)	(1.60)	(1.08)	(1.04)
N	1392	1724	1458	1279	1566	1499

	job prestige score	first job prestige	expected job prestige
GPA	2.716**	2.916**	1.814**
	(5.85)	(5.99)	(7.94)
ln Math score percentile	1.237**	1.369**	1.196**
	(3.37)	(4.16)	(1.71)
ln Math score	17.435**	26.144**	19.332**
	(2.85)	(5.27)	(4.57)
ln Reading score percentile	1.089**	1.322**	1.390**
	(2.84)	(3.44)	(4.63)
ln Reading score	20.044*	25.758**	30.897**
	(2.43)	(3.81)	(6.20)
N	1369	1265	1547

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.031+	-0.014	-0.006	-0.011*
	(1.94)	(0.43)	(1.10)	(2.53)
ln Math score percentile	0.019	0.005	-0.011+	-0.002
	(1.29)	(0.18)	(1.67)	(0.59)
ln Math score	0.392*	0.426	-0.179*	-0.056
	(2.41)	(1.45)	(2.18)	(0.84)
ln Reading score percentile	0.015	0.014	0.010+	-0.001
	(1.22)	(0.66)	(1.66)	(0.34)
ln Reading score	0.171	0.659+	0.089	-0.016
	(0.80)	(1.86)	(0.88)	(0.32)
N	1742	1799	1630	1469

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table A.5: First-generation Immigrants' (non-US-born) Adult outcomes: Extended specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.666**	0.027	0.298**	-0.019	-0.009	-0.016	-0.029
	(11.34)	(1.19)	(5.14)	(1.19)	(0.61)	(0.93)	(1.13)
ln Math score percentile	0.394**	0.037*	0.192**	0.002	0.009	0.005	0.002
	(6.36)	(2.11)	(3.19)	(0.18)	(0.83)	(0.40)	(0.15)
ln Math score	6.232**	0.211	2.140**	0.011	0.145	0.151	0.014
	(8.08)	(0.92)	(3.18)	(0.05)	(1.10)	(0.86)	(0.06)
ln Reading score percentile	0.326**	0.0215	0.107*	0.052**	0.044**	0.038*	0.053**
	(6.16)	(1.03)	(2.47)	(3.59)	(2.82)	(2.07)	(3.26)
ln Reading score	6.662**	0.053	2.525**	0.874**	0.801**	0.743**	1.093+
	(6.75)	(0.18)	(2.99)	(3.75)	(3.57)	(2.86)	(4.16)
N	1531	1517	1133	1502	1506	1505	1282

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	-0.024	-0.035**	-0.022+	-0.017*	-0.114**	-0.068
	(1.15)	(2.95)	(0.90)	(2.55)	(2.78)	(1.50)
ln Math score percentile	0.070*	-0.007	-0.020*	-0.012**	-0.028	-0.011
	(2.51)	(0.86)	(2.15)	(2.53)	(0.90)	(0.26)
ln Math score	0.761	-0.150+	-0.269*	-0.196**	-0.444	-0.383
	(1.59)	(1.67)	(2.04)	(3.07)	(0.94)	(0.59)
ln Reading score percentile	0.061*	0.001	-0.013	-0.204**	-0.015	-0.016
	(2.37)	(0.15)	(1.56)	(2.71)	(0.43)	(0.72)
ln Reading score	0.800	0.002	-0.222	-0.014**	-0.546	-0.226
	(1.49)	(0.01)	(1.50)	(3.29)	(0.88)	(0.45)
N	1209	1443	1244	1080	1376	1327

	job prestige score	first job prestige	expected job prestige
GPA	2.742**	2.004**	2.192**
	(6.09)	(5.79)	(5.40)
ln Math score percentile	1.348**	1.1613**	0.941*
	(3.47)	(2.74)	(2.38)
ln Math score	22.036**	21.479**	21.909**
	(3.98)	(3.90)	(4.07)
ln Reading score percentile	0.821*	0.943**	1.015**
	(2.10)	(3.16)	(2.87)
ln Reading score	19.569*	19.006*	23.117**
	(2.27)	(2.64)	(3.69)
N	1210	1133	1300

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.052**	0.012	-0.011	-0.019*
	(3.05)	(0.36)	(1.52)	(2.38)
ln Math score percentile	0.047**	-0.025	-0.008	-0.001
	(2.89)	(0.92)	(1.21)	(0.31)
ln Math score	0.874**	-0.392	-0.100	-0.073
	(3.84)	(1.01)	(1.24)	(0.94)
ln Reading score percentile	0.029*	-0.012	0.005	-0.003
	(2.46)	(0.48)	(0.97)	(0.73)
ln Reading score	0.619*	-0.033	0.110	-0.102
	(2.49)	(0.07)	(1.42)	(1.10)
N	1500	1544	1320	1311

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table A.6 : Second-generation Immigrants' (US-born) Adult outcomes: Extended specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.787**	0.004	0.398**	0.007	-0.001	0.002	0.015
	(16.74)	(0.22)	(7.04)	(0.54)	(0.07)	(0.18)	(0.80)
ln Math score percentile	0.446**	0.027	0.295**	0.021	0.013	0.003	0.014
	(7.19)	(0.95)	(4.41)	(0.97)	(0.66)	(0.16)	(0.62)
ln Math score	6.681**	-0.205	4.114**	0.134	0.074	-0.092	0.194
	(9.95)	(0.68)	(5.88)	(0.71)	(0.42)	(0.53)	(0.89)
ln Reading score percentile	0.483**	0.018	0.264**	0.043+	0.022	0.021	0.053+
	(9.25)	(0.87)	(4.61)	(1.94)	(1.09)	(1.02)	(1.98)
ln Reading score	7.680**	-0.134	3.869**	0.610*	0.243	0.242	0.750**
	(9.37)	(0.42)	(5.19)	(2.52)	(1.31)	(1.17)	(2.74)
N	1733	1708	1332	1675	1675	1678	1434

Labor market outcomes

	ln personal earnings	in labor force	unemployed	self-employed	income satisfaction	job satisfaction
GPA	0.026	-0.011	-0.009	-0.001	0.032	0.041
	(1.03)	(0.98)	(1.01)	(0.14)	(0.84)	(1.14)
ln Math score percentile	0.022	-0.003	0.004	-0.008	0.048	0.103**
	(0.98)	(0.23)	(0.50)	(1.23)	(1.18)	(2.74)
ln Math score	0.438	-0.125	0.010	-0.100	0.551	1.133*
	(1.12)	(0.89)	(0.09)	(1.04)	(0.97)	(2.29)
ln Reading score percentile	0.012	-0.013	-0.008	-0.012+	-0.036	-0.027
	(0.48)	(1.35)	(1.02)	(1.94)	(0.86)	(0.76)
ln Reading score	0.396	-0.159	-0.092	-0.179	-0.760	-0.135
	(0.97)	(1.22)	(0.55)	(1.50)	(1.17)	(0.26)
N	1394	1628	1438	1373	1563	1501

	job prestige prestige	first job prestige	expected job
GPA	2.246**	2.802**	1.825**
	(7.86)	(6.14)	(5.69)
ln Math score percentile	0.581+	1.239**	0.887*
	(1.71)	(3.83)	(2.21)
ln Math score	14.526*	26.300**	17.193**
	(2.64)	(5.48)	(3.21)
ln Reading score percentile	1.109**	1.575**	1.161*
	(3.24)	(4.29)	(2.45)
ln Reading score	18.145*	30.144**	23.305**
	(2.52)	(5.07)	(4.24)
N	1381	1260	1569

Health and social outcomes

	health insurance	subjective health	sick	arrested or incarcerated
GPA	0.034+	0.001	-0.013*	-0.019*
	(1.92)	(0.04)	(2.08)	(2.15)
ln Math score percentile	0.024*	0.031	-0.016*	-0.006
	(2.10)	(1.15)	(2.33)	(0.76)
ln Math score	0.248	0.847	-0357**	-0.100
	(1.14)	(2.41)	(4.02)	(0.76)
ln Reading score percentile	0.024	0.038	0.006	0.005
	(1.41)	(1.23)	(0.76)	(0.73)
ln Reading score	0.101	0.867+	-0.057	0.081
	(0.38)	(2.01)	(0.50)	(0.68)
N	1729	1758	1574	1618

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 5. t-statistics are reported in parentheses and are in absolute values (for binary dependent variables z-statistics are reported in parentheses and are in absolute values). Marginal effects (calculated at the mean of the independent variables) are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.